

## II. DISEASE SURVEILLANCE PROCEDURES AND RESPONSIBILITIES

### A. SURVEILLANCE PROCEDURES

Disease surveillance encompasses more than just reporting disease and is an essential element in any disease prevention and control program. The CHS commonly uses two approaches in disease surveillance:

1. **Passive disease surveillance** relies upon physicians and others fulfilling their statutory disease reporting requirement.
2. **Active disease surveillance** is a more aggressive and labor intensive approach to identifying cases of disease. It involves the daily, weekly or monthly contacting of physicians, hospitals, schools, or other agencies to “actively” search for cases. This type of surveillance has defined objectives, and usually continues for a relatively short period until the objectives are met. Active disease surveillance coincides with periods of high disease frequency and usually yields a much higher percentage of actual identified cases. It is also used during an outbreak to find additional cases of disease. For example, influenza surveillance is conducted during the active flu season - October through April.

The traditional sources of surveillance information are listed in Table A.

**Table A**

Major Traditional Sources of Surveillance Data in Kentucky

1. Morbidity Reports (Kentucky Reportable Disease Form – EPID 200 – Rev Jan/03)
2. Laboratory reports of infections
3. Outbreak investigation reports
4. Mortality reports (death certificates)
5. Active surveillance for specific diseases
6. Special surveys
7. Absentee data from school or work for selected diseases

Because most surveillance data are based on clinical cases, it is important to keep in mind the chain of events that must occur before a clinical case is confirmed (Table B).

**Table B**

Major Elements Needed for Surveillance of Clinical Illness:

1. Occurrence of clinical illness
2. Sufficient severity to seek medical care
3. Laboratory confirmation of diagnosis
4. Reporting of the disease to the LHD
5. Collection and analysis of data by LHD and/or DPH
6. Reporting of the disease to the Division of Epidemiology and Health Planning:  
Physicians, clinics, hospitals, laboratories, or others aware of a person with an acute or communicable disease should notify the LHD using the EPID–200 report form, adhering to the reporting time frames established by regulation.

The LHD should collect missing data, initiate a disease specific epidemiologic follow-up investigation, assure that adequate prevention and control measures are taken and notify the Division of Epidemiology and Health Planning in a timely manner.

For further information on the procedures for reporting, content of the report, urgency of the report, handling of reports by the local health department, and categories of disease to be reported please refer to either **Section III, C. Diseases Reportable at the State and National Level** or to the *Kentucky Disease Surveillance Administrative Regulation 902 KAR 2:020, Disease Surveillance*. (Appendix A)

## **B. SURVEILLANCE RESPONSIBILITIES**

### **1. Local Health Department Responsibilities:**

Each LHD has the option of maintaining a surveillance system in its jurisdiction that is compatible with the statewide surveillance system.

The LHD is expected to:

- a) Maintain a supply of *Kentucky Reportable Disease Forms - EPID 200 (Rev. Jan/03)* or camera ready copies for distribution to physicians, primary care practitioners, hospitals, clinics, schools, day care centers and/or others needing the forms.
- b) Receive, evaluate and transmit completed reports to the Division of Epidemiology and Health Planning.

- c) Investigate each reportable disease case to gather epidemiologic and laboratory data for local, state and national surveillance.
- d) Conduct a detailed follow-up to prevent future cases, identify the etiologic agent or agents, and identify the mode of transmission or risk factors associated with disease transmission.
- e) Consult with the state epidemiologist or DEHP staff whenever any unusual circumstances occur regarding the disease.
- f) Implement control measures for specific diseases consistent with section 9, Methods of Control, contained in the latest edition of *Control of Communicable Diseases Manual*, Chin, James (ed), or with specific measures issued by the state epidemiologist.

## **2. State Epidemiologist Responsibilities:**

The state epidemiologist has overall responsibility for state disease surveillance activities and is expected to:

- a) Provide consultation, technical assistance, and training regarding epidemiologic methods and disease control recommendations to LHDs.
- b) Provide guidelines consistent with state and national objectives, policies and current medical literature.
- c) Maintain a records system for receiving surveillance reports and for consolidation of the information into meaningful tables, graphs and charts, to analyze the data, prepare and disseminate summary reports.
- d) Act as liaison with the Centers for Disease Control and Prevention (CDC) and the Kentucky Division for Laboratory Services to assure rapid and accurate flow of information regarding disease control and specimen collection of communicable diseases throughout Kentucky.
- e) Assign appropriate state staff to perform epidemiologic investigations where surveillance data indicate a suspected disease outbreak, including activation of the Rapid Response Team when necessary.
- f) Assure that appropriate forms and information are supplied to LHDs as needed.

## C. DISEASES REPORTABLE AT THE STATE AND NATIONAL LEVEL

- 1. Kentucky Reporting Required within 24 hours:** The following diseases are of urgent health importance and shall be reported **IMMEDIATELY** by telephone or electronic submission to the patient's LHD or the DPH upon identification of a case or a suspected case. Complete and mail a **Kentucky Reportable Disease Form – EPID 200** within 24 hours. Public health intervention is expected as indicated in the footnotes. See Kentucky Administrative Regulation 902 KAR 2:020.

Anthrax<sup>1,4</sup>  
Botulism<sup>1,4</sup>  
Botulism, Infant<sup>1,2,4</sup>  
Brucellosis<sup>1,4</sup>  
Campylobacteriosis<sup>3,4</sup>  
Cholera<sup>1,3,4</sup>  
Cryptosporidiosis<sup>1,3,4</sup>  
Diphtheria<sup>1,3,4,5</sup>

Report **Immediately** by telephone:

- **Unexpected pattern of cases, suspected cases or deaths which may indicate a newly recognized infectious agent**
- **An outbreak, epidemic, related public health hazard or act of terrorism, such as SMALLPOX**

*Escherichia coli* O157:H7<sup>1,3,4</sup> or *Escherichia coli* shiga toxin positive<sup>3,4</sup>

Encephalitis, Arboviral<sup>1,4</sup>

California Group encephalitis

Eastern Equine encephalitis

St. Louis encephalitis

Venezuelan Equine encephalitis

Western Equine encephalitis

West Nile virus encephalitis

Haemophilus influenzae, invasive disease<sup>1,2,3,5</sup>

Hansen's Disease<sup>1,2,4</sup>

Hantavirus infection<sup>1,2,3,4</sup>

Hepatitis A<sup>1,2,3,4,5</sup>

Listeriosis<sup>2,4</sup>

Measles<sup>1,2,3,4,5</sup>

Meningococcal disease<sup>1,2,3,4,5</sup>

Pertussis<sup>1,2,3,4,5</sup>

Plague<sup>1,4,5</sup>

Poliomyelitis<sup>1,2,4,5</sup>

Psittacosis<sup>1,2,4</sup>

Q Fever<sup>3,4</sup>

Rabies, animal<sup>1,3,4,5</sup>

Rabies, human<sup>1,3,4,5</sup>

Rubella<sup>1,2,4,5</sup>

Rubella (congenital syndrome)<sup>1,2,5</sup>

Salmonellosis<sup>1,3,4</sup>

Shigellosis<sup>1,3,4</sup>

Syphilis, primary, secondary, early latent or congenital<sup>1,4,5</sup>

### Key

- <sup>1</sup> Infectious diseases designated as notifiable at the national level.
- <sup>2</sup> Kentucky or CDC follow-up form is required. LHDs have templates of these forms in the Desk Reference.
- <sup>3</sup> High-risk assessment by LHD is needed (e.g., is patient or member of patient's household employed in food handling, day care, or health care?)
- <sup>4</sup> Source investigation by LHD is needed.
- <sup>5</sup> Patient contacts should be immediately evaluated for possible biologic prophylaxis.

Tetanus<sup>1,2,4</sup>  
Tularemia<sup>3,4</sup>  
Typhoid fever<sup>1,2,3,4</sup>  
*Vibrio parahaemolyticus*<sup>2,3,4</sup>  
*Vibrio vulnificus*<sup>2,3,4</sup>  
Yellow Fever<sup>1,4</sup>

2. **Kentucky Reporting Required within 1 business day:** The following diseases require priority notification. They shall be reported to the LHD or DPH on a **Kentucky Reportable Disease Form – EPID 200** or other means within 1 business day of the identification of a case or suspect case. Public health intervention is expected. The LHD shall notify the DPH of the case within five (5) business days.

Foodborne and Waterborne Outbreaks<sup>2,4</sup>  
Hepatitis B, acute<sup>1,2,3,4,5</sup>  
Hepatitis B infection in a pregnant woman or a child born in or after 1992<sup>1,2,3,4,5</sup>  
Mumps<sup>1,2,4,5</sup>  
Streptococcal disease, invasive, Group A<sup>1,2,3,4</sup>  
Toxic shock syndrome<sup>1,2,4</sup>  
Tuberculosis<sup>1,2,3,4,5</sup>

3. **Kentucky Reporting Required within 5 business days:** The following diseases shall be reported to the LHD on a **Kentucky Reportable Disease Form –EPID 200** or other means within 5 business days of the identification of a case or suspect case. Public health intervention is expected, and the report forwarded to the DPH within three (3) business days.

Chancroid<sup>1,4</sup>  
Chlamydia trachomatis<sup>1,4,5</sup>  
Ehrlichiosis<sup>1,4</sup>  
Gonorrhea<sup>1,4,5</sup>  
Granuloma inguinale  
Hepatitis C, acute<sup>1,2,4</sup>  
Histoplasmosis<sup>4</sup>  
Lead poisoning  
Legionellosis<sup>1,2,4</sup>  
Lyme disease<sup>1,2</sup>  
Lymphogranuloma venereum  
Malaria<sup>1,2,4</sup>  
Rabies, post-exposure prophylaxis  
Rocky Mountain spotted fever<sup>1,2,4</sup>  
*Streptococcus pneumoniae*, drug-resistant invasive disease<sup>1,2,4</sup>  
Syphilis, other than primary, secondary, early latent or congenital<sup>1,4</sup>  
Toxoplasmosis<sup>4</sup>

4. **Kentucky Reporting Required of Laboratories:** In addition to the reports required under 1,2,3, and 4 of this section, laboratory results shall be reported weekly for Influenza virus isolates.

Upon request of the DPH, a clinical laboratory shall report antimicrobial resistance patterns for the following organisms:

Staphylococcus aureus  
Enterococcus species  
Other organism specified in a request

5. **Kentucky Reporting Required of HIV and AIDS:** Health professionals licensed under Chapters 311 through 314, health facilities licensed under KRS Chapter 216B, and laboratories licensed under KRS Chapter 333, shall report HIV infections and AIDS diagnoses within **five (5)** business days on the **Adult HIV/AIDS Confidential Case Report** or the **Pediatric HIV/AIDS Confidential Case Report**.

Acquired Immune Deficiency Syndrome (AIDS) <sup>1,2</sup>  
Human Immunodeficiency Virus (HIV) infection <sup>2</sup>, pediatric <sup>1,2</sup>

Reports for residents of Jefferson, Henry, Oldham, Bullitt, Shelby, Spencer, and Trimble Counties shall be submitted to the HIV/AIDS Surveillance Program of the Jefferson County Health Department, telephone 502-574-6574.

Reports for residents of all other Kentucky counties shall be submitted to the HIV/AIDS Surveillance Program of the Kentucky Department for Public Health, or as directed by the HIV/AIDS project coordinator, telephone 502-564-6539.

**Never report an HIV/AIDS case by fax machine or answering machine. Do not leave identifying information about HIV/AIDS patients on the call recorder.**

6. **Kentucky Reporting required within three months:** A provider shall submit name, address, birth date, and county of residence for persons diagnosed with the following to the DPH.

Asbestosis  
Coal Worker's Pneumoconiosis  
Silicosis



**Kentucky Reportable Disease Form**  
**Department for Public Health**  
**Division of Epidemiology and Health Planning**  
**275 East Main St., Mailstop HS1E-C**  
**Frankfort, KY 40621-0001**

Disease Name \_\_\_\_\_

**Mail Form to Local Health Department**

DEMOGRAPHIC DATA						
Patient's Last Name		First	M.I.	Date of Birth / /	Age	Gender <input type="checkbox"/> M <input type="checkbox"/> F <input type="checkbox"/> Unk
Address		City	State	Zip	County of Residence	
Phone Number	Patient ID Number	Ethnic Origin <input type="checkbox"/> His. <input type="checkbox"/> Non-His.		Race <input type="checkbox"/> W <input type="checkbox"/> B <input type="checkbox"/> A/PI <input type="checkbox"/> Am.Ind. <input type="checkbox"/> Other		
DISEASE INFORMATION						
Disease/Organism				Date of Onset / /	Date of Diagnosis / /	
List Symptoms/Comments				Highest Temperature		
				Days of Diarrhea		
Hospitalized? <input type="checkbox"/> Yes <input type="checkbox"/> No	Admission Date / /	Discharge Date / /	Died? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk	Date of Death / /		
Hospital Name:			Is Patient Pregnant? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, # wks _____			
School/Daycare Associated? <input type="checkbox"/> Yes <input type="checkbox"/> No			Outbreak Associated? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Name of School/Daycare:			Food Handler? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Person or Agency Completing form: Name: _____ Agency: _____				Attending Physician: Name: _____		
Address: _____				Address: _____		
Phone: _____		Date of Report: / /		Phone: _____		
LABORATORY INFORMATION						
Date	Name or Type of Test	Name of Laboratory	Specimen Source	Results		
ADDITIONAL INFORMATION FOR SEXUALLY TRANSMITTED DISEASES ONLY						
Method of case detection: <input type="checkbox"/> Prenatal <input type="checkbox"/> Community & Screening <input type="checkbox"/> Delivery <input type="checkbox"/> Instit. Screening <input type="checkbox"/> Reactor <input type="checkbox"/> Provider Report <input type="checkbox"/> Volunteer						
Disease: <input type="checkbox"/> Syphilis		Stage <input type="checkbox"/> Primary (lesion) <input type="checkbox"/> Secondary (symptoms) <input type="checkbox"/> Early Latent <input type="checkbox"/> Late Latent <input type="checkbox"/> Congenital <input type="checkbox"/> Other		Disease: <input type="checkbox"/> Gonorrhea <input type="checkbox"/> Chlamydia <input type="checkbox"/> Chancroid		Site: (Check all that apply) <input type="checkbox"/> Genital, uncomplicated <input type="checkbox"/> Pharyngeal <input type="checkbox"/> Anorectal <input type="checkbox"/> Other _____
				<input type="checkbox"/> Ophthalmic <input type="checkbox"/> PID/Acute Salpingitis		Resistance: <input type="checkbox"/> Penicillin <input type="checkbox"/> Tetracycline <input type="checkbox"/> Other _____
Date of spec. Collection	Laboratory Name	Type of Test	Results	Treatment Date	Medication	Dose
If syphilis, was previous treatment given for this infection? <input type="checkbox"/> Yes <input type="checkbox"/> No						
If yes, give approximate date and place _____						

**902 KAR 2:020 requires health professionals to report the following diseases to the local health departments serving the jurisdiction in which the patient resides or to the Kentucky Department for Public Health (KDPH).**

(Copies of 902 KAR 2:020 available upon request)

**REPORT IMMEDIATELY by TELEPHONE to the Local Health Department or the KY Department for Public Health:**

- Unexpected pattern of cases, suspected cases or deaths which may indicate a newly recognized infectious agent
- An outbreak, epidemic, related public health hazard or act of bioterrorism, such as SMALLPOX

**Kentucky Department for Public Health in Frankfort**  
**Telephone 502-564-3418 or 1-888-9REPORT (973-7678)**  
**FAX 502-696-3803**

**REPORT WITH 24 HOURS**

Anthrax	Encephalitis, West Nile	Rabies, animal
Botulism	<i>Haemophilus influenzae</i>	Rabies, human
Brucellosis	invasive disease	Rubella
Campylobacteriosis	Hansen's disease	Rubella syndrome, congenital
Cholera	Hantavirus infection	Salmonellosis
Cryptosporidiosis	Hepatitis A	Shigellosis
Diphtheria	Listeriosis	Syphilis, primary, secondary,
<i>E. coli</i> O157:H7	Measles	early latent or congenital
<i>E. coli</i> shiga toxin positive	Meningococcal infections	Tetanus
Encephalitis, California group	Pertussis	Tularemia
Encephalitis, Eastern Equine	Plague	Typhoid Fever
Encephalitis, St. Louis	Poliomyelitis	<i>Vibrio parahaemolyticus</i>
Encephalitis, Venezuelan Equine	Psittacosis	<i>Vibrio vulnificus</i>
Encephalitis, Western Equine	Q Fever	Yellow Fever

**REPORT WITHIN ONE (1) BUSINESS DAY**

Foodborne outbreak	Hepatitis B, acute	Toxic Shock Syndrome
Hepatitis B infection in a	Mumps	Tuberculosis
pregnant woman or child	Streptococcal disease	Waterborne outbreak
born in or after 1992	invasive, Group A	

**REPORT WITHIN FIVE (5) BUSINESS DAYS**

⚠ AIDS	⚠ HIV infection	Rocky Mountain
Chancroid	Lead poisoning	spotted fever
<i>Chlamydia trachomatis</i>	Legionellosis	<i>Streptococcus pneumoniae</i> ,
infection	Lyme disease	drug-resistant invasive
Ehrlichiosis	Lymphogranuloma venereum	disease
Gonorrhea	Malaria	Syphilis, other than primary,
Granuloma inguinale	Rabies, post exposure	secondary, early latent or
Hepatitis C, acute	prophylaxis	congenital
Histoplasmosis		Toxoplasmosis

Influenza virus isolates to be reported weekly by laboratories.

902 KAR 02.065 requires long term care facilities to report an outbreak (2 or more cases) of influenza-like illnesses (ILI) within 24 hours to the local health department or the KDPH.

⚠ *All cases of HIV infections/AIDS are reportable to a separate surveillance system in accordance with KRS 211.180(1)b. To obtain report forms contact the HIV/AIDS Branch at (502)-564-6539.*

**DO NOT REPORT ON THIS FORM.**

**Note: Animal bites shall be reported to local health departments within twelve (12) hours in accordance with KRS 258.065**





**KENTUCKY REPORTABLE DISEASES AND CONDITIONS**  
**Cabinet for Health Services**  
**Department for Public Health**

902 KAR 2:020 requires health professionals to **report** the following diseases to the local health department serving the jurisdiction in which the patient resides or to the Department for Public Health.

- |   |   |  |
|---|---|--|
| <ul style="list-style-type: none"><li><input checked="" type="checkbox"/> <b>AIDS**</b></li><li>▼ Animal bites</li><li>① Animal conditions known to be communicable to man</li><li>☒ <b>Anthrax</b><ul style="list-style-type: none"><li>Asbestosis</li></ul></li><li>☒ <b>Botulism, including infant</b></li><li>☒ <b>Brucellosis</b></li><li>☒ <b>Campylobacteriosis</b></li><li><input checked="" type="checkbox"/> Chancroid</li><li><input checked="" type="checkbox"/> <i>Chlamydia trachomatis</i></li><li>☒ <b>Cholera</b><ul style="list-style-type: none"><li>Coal workers' pneumoconiosis</li></ul></li><li>☒ <b>Cryptosporidiosis</b></li><li>☒ <b>Diphtheria</b></li><li>☒ <i>E. coli</i>, O157:H7</li><li>☒ <i>E. coli</i>, shiga toxin positive</li><li><input checked="" type="checkbox"/> Ehrlichiosis</li><li>☒ <b>Encephalitis, California group</b></li><li>☒ <b>Encephalitis, Eastern Equine</b></li><li>☒ <b>Encephalitis, St. Louis</b></li><li>☒ <b>Encephalitis, Venezuelan Equine</b></li><li>☒ <b>Encephalitis, Western Equine</b></li><li>☒ <b>Encephalitis, West Nile</b></li><li>① Foodborne outbreak/intoxication</li><li><input checked="" type="checkbox"/> Gonorrhea</li><li><input checked="" type="checkbox"/> Granuloma inguinale</li><li>☒ <i>Haemophilus influenzae</i> invasive disease</li></ul> | <ul style="list-style-type: none"><li>☒ <b>Hansen's Disease</b></li><li>☒ <b>Hantavirus infection</b></li><li>☒ <b>Hepatitis A</b></li><li>① Hepatitis B, acute</li><li>① Hepatitis B, Perinatal</li><li><input checked="" type="checkbox"/> Hepatitis C, acute</li><li><input checked="" type="checkbox"/> Histoplasmosis</li><li><input checked="" type="checkbox"/> <b>HIV infection**</b><ul style="list-style-type: none"><li>Influenza virus isolates</li></ul></li><li>☒ ILI's in long term care facilities</li><li><input checked="" type="checkbox"/> Lead poisoning</li><li><input checked="" type="checkbox"/> Legionellosis</li><li>☒ <b>Listeriosis</b></li><li><input checked="" type="checkbox"/> Lyme Disease</li><li><input checked="" type="checkbox"/> Lymphogranuloma venereum</li><li><input checked="" type="checkbox"/> Malaria</li><li>☒ <b>Measles</b></li><li>☒ <b>Meningococcal infection</b></li><li>① Mumps</li><li>☒ <b>Mycotoxins-T2</b></li><li>☒ <b>Pertussis</b></li><li>☒ <b>Plague</b></li><li>☒ <b>Poliomyelitis</b></li><li>☒ <b>Psittacosis</b></li><li>☒ <b>Q fever</b></li><li>☒ <b>Rabies, animal</b></li><li>☒ <b>Rabies, human</b></li><li><input checked="" type="checkbox"/> Rabies post-exposure prophylaxis</li></ul> | <ul style="list-style-type: none"><li>☒ <b>Ricin poisoning</b></li><li><input checked="" type="checkbox"/> Rocky Mountain spotted fever</li><li>☒ <b>Rubella</b></li><li>☒ <b>Rubella syndrome, congenital</b></li><li>☒ <b>Salmonellosis</b></li><li>☒ <b>Shigellosis</b><ul style="list-style-type: none"><li>Silicosis</li></ul></li><li>☒ <b>Smallpox</b></li><li>☒ <b>Staphylococcal enterotoxin B</b></li><li>① Streptococcal disease, invasive Group A</li><li><input checked="" type="checkbox"/> <i>Streptococcus pneumoniae</i>, drug-resistant invasive disease</li><li>☒ <b>Syphilis, primary, secondary early latent or congenital</b></li><li><input checked="" type="checkbox"/> Syphilis, other than primary secondary, early latent or congenital</li><li>☒ <b>Tetanus</b></li><li>① Toxic shock syndrome</li><li><input checked="" type="checkbox"/> Toxoplasmosis</li><li>① Tuberculosis</li><li>☒ <b>Tularemia</b></li><li>☒ <b>Typhoid fever</b></li><li>☒ <i>Vibrio parahaemolyticus</i></li><li>☒ <i>Vibrio vulnificus</i></li><li>☒ <b>Viral hemorrhagic fevers</b></li><li>① Waterborne outbreaks</li><li>☒ <b>Yellow fever</b></li></ul> |
|---|---|--|

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☒ **POSSIBLE INDICATOR OF BIOTERRORISM—REPORT IMMEDIATELY**

- ☒ **REPORTING REQUIRED WITHIN 24 HOURS-** by telephone or FAX, followed by written report.
  - ① **REPORTING REQUIRED WITHIN 1 BUSINESS DAY-** by telephone or FAX, followed by written report.
  - ☒ **REPORTING REQUIRED WITHIN 5 BUSINESS DAYS**
  - ▼ Report animal bites within 12 hours to the local health department in accordance with KRS 258.065.
- .....

**REPORT IMMEDIATELY by TELEPHONE to the Local Health Department or the KDPH:**

- Unexpected pattern of cases, suspected cases or deaths which may indicate a newly recognized infectious agent
- An outbreak, epidemic, related public health hazard or act of bioterrorism, such as SMALLPOX

**Kentucky Department for Public Health in Frankfort**  
**Telephone 502-564-3418 or 1-888-9REPORT (973-7678)**  
**FAX 502-696-3803**

Fax report form (EPID 200) to above fax number or mail to Division of Epidemiology and Health Planning, 275 East Main St. Mailstop HS1E-C, Frankfort, KY 40621-0001

\*\*To report HIV/AIDS or obtain report forms in Louisville area – (Bullitt, Henry, Jefferson, Oldham, Shelby, Spencer, Trimble counties) call the HIV/AIDS Louisville Jefferson County Surveillance Program at 502-574-6574. In all other Kentucky counties contact the HIV/AIDS Branch at 502-564-6539. **NEVER REPORT AN HIV/AIDS CASE BY FAX MACHINE OR ANSWERING MACHINE**